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Dear Sir:

Export sales of uranium ore and concentrates by Canada were more than double for the first seven months of 1957 as compared with the like 1956 period. For the 1956 period, shipments totaled $26,093,543 while the 1957 seven month total was $55,520,646. All sales were made to the United States in these periods; none to any other nation.....Exploration projects for uranium, thorium, mercury and rare earths in which the Defense Minerals Exploration Administration is financially participating may now receive only 50% instead of the previous 75% financial assistance of the DMEA, under DMEA order #1, revised, effective October 22nd, 1957.

Radioactive waste disposal service is to be furnished by American Mail Lines, Seattle, Wash., and California Salvage Co., San Pedro, Calif. The companies have applied to the USAEC for licenses to conduct such services.....Fenn Manufacturing Co., Newington, Conn., producer of metal forming equipment for nuclear industrial purposes, has recently made shipments of rolling mills to Westinghouse Metal Plant, Blairsville, Pa.; to the U. S. Naval Research Laboratory, Washington, D.C.; and to Babcock & Wilcox Co. The firm has also shipped swaging machines to General Atomics division of General Dynamics Corp. (Other PRODUCTS, SERVICES, p. 3 this LETTER.)

Order for 246 magnet cores, for the accelerator being built at Brookhaven National Laboratory, Upton, N.Y., has been received by the Eddystone division of Baldwin-Lima-Hamilton Corp. Value of the contract was not disclosed; entire installation is being built at estimated cost of $26 million. (Other CONTRACTS LET, BIDS ASKED, p. 2 this LETTER.)

Rights issue by The Rio Tinto Co., of London, England, underwritten by N. M. Rothschild & Sons, offers stockholders rights to purchase one additional share for each six shares now held. A total of 2,084,000 shares makes up the offering, and the new capital to be raised will amount to approximately £5 million, after meeting issue expenses. The new funds are primarily for the company's Canadian uranium mines, the offering states, as well as for other exploration and development programs. Further investment in Canada will be made in the main through Rio Tinto Mining Co. of Canada, Ltd., which in turn will be advancing money to Northspan Uranium Mines, Ltd., to assist in the completion of the latter's four mines in the Blind River area. (Other FINANCIAL NEWS, p. 5 this LETTER.)

Conference last fortnight on controlled thermonuclear reactions, held at Princeton, N.J., saw Sir John Cockcroft heading the group from the U.K. Atomic Energy Authority which met with J. L. Tuck, E. D. Shipley, Lyman Spitzer and others from USAEC-supported thermonuclear projects. Meeting was under provisions of bi-lateral U.S.-U.K. agreement for exchange of information on civil uses of atomic energy. Reports from the meeting on temperatures reached by U.K. and U.S. experimenters during experimental work suggest the achievement of neutrons from thermonuclear reactions, an important step in the long range effort to develop thermonuclear reactors for production of economic power. (Other MEETINGS, COURSES, CONFERENCES, p. 4 this LETTER.)

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BIDS ASKED, CONTRACTS AWARDED...on nuclear projects...

BIDS ASKED:- Fixed price proposals have been asked by the USAEC for construction of a 1000 KW research and training reactor at the Puerto Rico Nuclear Center, which will be located adjacent the University of Puerto Rico's College of Agriculture & Mechanic Arts at Mayaguez. Contractor is to design, fabricate, install and test the reactor, and train personnel. Design criteria calls for pool-type reactor, for training and research, to have fuel elements enriched in uranium-235 up to 20%, with a thermal column and several fixed beam holes for research purposes. Proposals must be submitted no later than Nov. 23rd, 1957; the USAEC's Oak Ridge Operations office is handling the matter.

CONTRACTS AWARDED:- From among 31 architect engineer firms submitting bids, USAEC has selected Kaiser Engineers, Oakland, Calif., to do the engineering design of a natural uranium, graphite moderated, gas-cooled nuclear electric power plant of approximately 40,000 electrical KW capacity. Kaiser has retained ACF Industries, Inc., New York, as nuclear design subcontractor. The work will be done under a cost-type contract. The USAEC must submit to Congress by April 1, 1958 a report on the design, including cost estimates and construction schedules. At last session, Congress appropriated $3 million for this phase of the project. (In another action of the Commission, its contract with Kaiser Engineers for design and construction of a food irradiation reactor is being terminated. The reactor was deing developed for use by the Army Quartermaster Corps in food irradiation experiments and other projects at the Army's ionizing radiation center to be built at Stockton, Calif. Reactor project is being deferred while the Army investigages alternative sources of gamma irradiation such as long-lived radioisotopes or spent reactor fuel elements.)

PROPOSALS RECEIVED:- Eighteen proposals from U. S. industrial firms have been received by the USAEC and the Maritime Administration to develop a nuclear ship propulsion system consisting of a gas-cooled reactor coupled with a closed cycle gas turbine. (Now being built in another project is a water-cooled reactor for a merchant ship power plant.) Firms submitting bids were: Aerojet General; Aeronautronic Systems; Alco Products: Allis-Chalmers; American-Standard; Armour Institute; Bell Aircraft; Borg Warner; Curtiss-Wright; Ford Instrument; General Dynamics; General Electric; General Motors; U. S. Industries; Martin Co.; Atomics International; Pratt & Whitney; and Westinghouse Electric.

ATOMIC ENERGY PATENT DIGEST...latest grants...

ISSUED October 15, 1957 to PRIVATE ORGANIZATIONS AND/OR INDIVIDUALS:- (1) Process for making a well log with radioactive tracers. E. S. Mardock, inventor. No. 2,801,076 assigned to Well Surveys, Inc., Tulsa, Okla. (2) Compact X-ray generator. A. J. Gale, inventor. No. 2,810,077 assigned to High Voltage Engineering Corp., Burlington, Mass.

ISSUED October 15, 1957 to GOVERNMENT ORGANIZATIONS:- (1) Method of alloying reactive metals with aluminum or beryllium. O. J. C. Runnalls, inventor. No. 2,809,887 assigned to USAEC. (2) Nuclear reactor system. Farrington Daniels, inventor. No. 2,809,931 assigned to USAEC.

ISSUED October 22, 1957 to PRIVATE ORGANIZATIONS AND/OR INDIVIDUALS:- (1) Apparatus employing radioactive isotopes. E. G. Linder, inventor. No. 2,810,850 assigned to Radio Corp. of America, New York, N.Y. (2) Linear accelerators for charged particles. C. W. Miller, M. C. Crowley-Milling, inventors. No. 2,810,855 assigned to Metropolitan-Vickers Electrical Co., Ltd., London, England.

ISSUED October 22, 1957 to GOVERNMENT ORGANIZATIONS:- (1) Pulse amplitude amplifier. G. W. Gray, A. S. Jensen, inventors. No. 2,810,828 assigned to USAEC. (2) Radioactive container. D. McH. Ferguson, inventor. No. 2,810,839 assigned to U.S. Air Force. (3) Process for producing uranium hexafluoride. R. D. Fowler, inventor. No. 2,810,626 assigned to USAEC. (4) Fluid moderated reactor. E. P. Wigner, L. A. Ohlinger, G. J. Young, A. M. Weinberg, inventors. No. 2,810,689 assigned to USAEC.

PATENT NOTES:- Now available are specifications for three patents developed within the U.K. Atomic Energy Authority and connected with the design of the graphite structure used in the building of Calder Hall nuclear power station. The patents involved, which also include details of fuel element support, are Nos. 784,291 & 784,292 both of which are obtainable now, and No. 785,876 which will be available Nov. 6th. Specification may be ordered from Patent Office, 25 Southampton Bldgs., London W.C.2, at 3s 6d a copy including postage.

NEW BOOKS & OTHER PUBLICATIONS...on nuclear subjects...

Atomic Energy Facts. Handbook on nuclear operations in the U.S.; prepared by the USAEC. For industrial management, etc. 216 pages. --Supt. of Documents, Wash. 25, D. C. ($2.00)

Effects of Radiation & Fallout. Discussion of genetic effects of ionizing radiation. -- Public Affairs Committee, 22 E. 38th St., New York 16. (25¢)

Mining Methods & Costs; Continental Uranium, Inc. Technical report no. IC-7801 giving in detail operations at Continental's no. 1 mine, San Juan County, Utah. --U. S. Bureau of Mines, 4800 Forbes St., Pittsburgh 13, Pa. (n/c)

Productive Uses of Nuclear Energy. Summarizes findings of this organization, with suggested U. S. policies. --National Planning Assoc., Wash., D. C. ($1.50)

Nuclear Powered Ships for American Ship Operators. Proceedings of USAEC-Maritime Administration symposium held July 30, 1957, Washington, D.C. ($5.50)..... Reports on Controlled Thermonuclear Processes. Bibliography of 55 references to non-secret USAEC reports. No. TID-3506, revised. (50¢)..... Boundary Layer Radioactive Tracer Technique. Work done at N. C. State College for Wright Air Development Center. No. PB-111677. ($2.75)..... Above from Office of Technical Services, Wash. 25, D. C.

Careers in Atomic Energy. U. S. Office of Education booklet describes job opportunities, training programs, etc. Mentions that 7,000 persons are now employed directly by the USAEC, with 90,000 working for contractors to the Commission. -- Sup't. of Documents, Wash. 25, D. C. (25¢)

Atomic Energy & Agriculture. Proceedings of Oak Ridge Institute of Nuclear Studies Symposium held Dec. 27-29, 1955, Atlanta, Ga.; covers 22 papers. --Amer. Assoc. for Advancement of Science, 1515 Mass. Ave., N.W., Wash. 5, D.C. ($9.50)

Neutron Cross Sections, by D. J. Hughes, Brookhaven National Laboratory. One of this publisher's international series of monographs on nuclear energy. Well presented explanation of the principles of cross section theory, measurement, and use. 182 pages. --Pergamon Press, 122 E. 55th St., New York 22, N.Y. ($5.00)

PRODUCTS, PROCESSES, SERVICES...in the nuclear field...

PRODUCT NEWS:- Offered by New England Nuclear Corp. is tritiated progesterone-16-H-3 at 1.8 millicuries per milligram. The high specific activity, the company feels, will extend the detectable range of progesterone in biological systems. Details concerning this and other high specific activity tritiated compounds, available on a commercial basis for the first time, may be obtained from the company at 575 Albany St., Boston 18, Mass.

An additional low-level radioactive sealed source which may be owned and used without specific license from the USAEC has been placed under this general license by Commission amendment of its byproduct material regulation. effective Oct. 15th. This sealed source, which is an ion generating tube containing not more than 50 millicuries of hydrogen-3, finds use in air conditioning and other equipment.

MANUFACTURERS' FACILITIES:- Completion of a 6400 square foot addition by Radiation Counter Laboratories, Skokie, Ill., will give that nuclear instrument manufacturer floor area double the size of its present plant. The construction, now underway, is expected to be completed by late November, and will give the company additional production and administration space. (RCL reported gross sales for the last two quarters in excess of a $2 million annual rate; this was the highest in the company's ten year history.)

Now in use at Inland Testing Laboratories division of Cook Electric, Chicago, is installation with 62,000 curies of cobalt-60. Inland plans to use the installation to test the effect of gamma radiation on fuels, lubricants, and hydraulic fluids; its size will permit dynamic testing of materials rather than static tests made in smaller facilities. Some $400,000 was spent by Inland for its radiation setup, as part of a $4 million technical center being built by Cook near Chicago.

Production space and facilities of Radiation Instrument Development Laboratory, Chicago, have been more than tripled in the newly completed addition to its building at 5737 S. Halsted St. The company has also expanded its staff, with three new engineers recently joining the company.

MANUFACTURERS' LITERATURE:- New bulletin on obtaining engineering data through radiochemistry is offered by Nuclear Science & Engineering Corp., P.O. Box 10901, Pittsburgh 36, Pa. The bulletin (No. 408) describes applications and cites successful case histories.

Nov. 6th. Specification may be ordered from Patent Office, 25 Southampton Bldgs., London W.C.2, at 3s 6d a copy including postage.

ATOMIC ENERGY OUTSIDE THE U. S....

CANADA:- Studies at Atomic Energy of Canada's Chalk River establishment of a reactor with electric output of 200,000 KW shows promise of producing electricity with ultimate cost of not more than 6 mils per KWH, the company's annual report shows. To serve as a prototype for this larger reactor is the demonstration power reactor (NPD), which is a current project. The NPD reactor will use heavy water as moderator and natural uranium as fuel. Chalk River's NRU reactor, completed in June, is undergoing test procedures expected to take 3-4 months before going critical. Plutonium produced by the NRU reactor will be sold under contract to the USAEC, while the high flux of the reactor will enable production of a large supply of various isotopes, notably cobalt-60. For the year covered in the report, the company spent $23,136,252 for its research program, all but approximately $2 million of which was derived from the total parliamentary appropriation of $31,024,417 which the company received. It estimates its net cash requirements for the year ending Mar. 31, 1958 at $34,510,365.

UNITED KINGDOM:- National Institute for Research in Nuclear Science has awarded contract to Joseph Sankey & Sons, Ltd., for the magnet yoke, a major component of the proton-synchrotron being built for the Institute on a site adjacent to the Atomic Energy Research Establishment, Harwell. The 340 steel blocks required, each weighing 20-tons, are to be furnished at a total cost of over £1,250,000.

Highly enriched uranium-235 will most likely be the fuel utilized in an aircraft nuclear reactor, since it enables use of a very much smaller system than with natural uranium, J. V. Dunworth, head of the reactor division of the Atomic Energy Research Establishment, Harwell, told the Royal Aeronautical Society at its recent Folkstone meeting. Because of damage to the fuel by the radiation present in the reactor, and also for nuclear reasons, Dr. Dunworth noted that the fuel in an aircraft nuclear reactor will have a life approaching 100 days operation at full power before reprocessing is necessary; and this fuel must be present at all times in the aircraft. This fuel, he observed, may be roughly competitive with the high cost of a quantity of petroleum of equivalent heat content. Discussing shielding problems, and how reductions may be made in shield weight, Dr. Dunworth noted that an alternative to conventional reactor shielding is to split the shield and place some of the shield around the crew (assuming that only a small number of persons are carried in the aircraft). While this introduces new problems at landing and take-off, due to ground scatter from reactor to crew, and will also limit ground crew access, shields weighing less than 100 tons may be possible in non-passenger-carrying aircraft, Dr. Dunworth stated. Hazards resulting from the crash of a nuclear powered aircraft present a serious objection to such use of nuclear power, and it is a problem that must be given close attention, he emphasized.

MEETINGS, COURSES, CONFERENCES...on nuclear subjects...

CONFERENCES:- Last week's "Atoms for Power" conference at Arden House, Harriman, N.Y., sponsored by the Twelfth American Assembly, asked for more progress by the U. S. in the nuclear power field. The conferees included nuclear physicists, industrialists, Government officials, newspaper publishers, and educators. In their report, they asked for a clear formulation of the U.S.'s atomic power program, with immediate and long term U. S. requirements definitely established.

Fourth annual conference of Atomic Industrial Forum, being held in New York this week (Oct. 28-30), is in conjunction with the Atomfair (Oct. 28-31), where more than 130 exhibitors are showing products related to nuclear industrial and Government work.

Analytical Chemistry in Nuclear Reactor Technology is conference to be sponsored by Oak Ridge National Laboratory in Gatlinburg, Tenn., Nov. 4-6. It will be the first of an annual series of unclassified meetings. Further information from: D. D. Cowen, ORNL, Oak Ridge, Tenn.

SYMPOSIUM:- One day symposium on "Tritium in Tracer Applications" is to be held Nov. 22nd, in New York, under sponsorship of New England Nuclear Corp., in association with Atomic Associates, Inc., and Packard Instrument Co. Further information from: New England Nuclear Corp., 575 Albany St., Boston 18, Mass.

COURSES:- Radiological Safety course is being offered by medical school of New York University, Jan. 6-17, 1958, with tuition set at $90 for the two weeks. Information from: Off. of the Assoc. Dean, NYU Medical School, 550 1st Ave., New York 16, N. Y.

ful case histories.

ATOMIC ENERGY FINANCIAL NEWS...

METAL PRODUCER'S EARNINGS TO BE AT 1956 LEVELS: Lindsay Chemical Co. expects that the nine months ending Sept. 30th, 1957 will show about what the firm did during 1956, according to an official of the firm. The fourth quarter of this year will be lower than last year because of rare earth customer inventory retrenchment and Government contract stretchouts. For the first nine months last year, Lindsay earned $2.55 per share and for the full year earned $3.65 a common share on net sales of $8,966,899. Lindsay, largest thorium refiner in the U.S., is now operating its thorium production facilities almost at capacity, and expects to continue at that rate. The company still has over two years to go on a three year USAEC contract to supply several million pounds of thorium. Sales of the element account for 30% to 40% of the company's annual volume.

URANIUM PRICE REDUCTION AFFECTS COMPANY'S EARNINGS:- Vanadium Corp. of America's third quarter operations for this year were affected by a reduction which the USAEC made in the price of uranium concentrates produced at the firm's mill in Naturita, Colo., a company spokesman has stated. Major portion of the company's business is in metals other than uranium, although this particular phase of its business is an important segment. Vanadium's net for the third quarter of 1957 was about $880,000 or almost 70¢ a share, off from $1,078,893 or 77¢ a share earned in the like 1956 period.

NEW COMMON STOCK ISSUE BY NUCLEAR POWER COMPANY:- An additional $3 million in common stock is to be sold by Yankee Atomic Electric Co. to its 12 sponsoring stockholder companies, under terms of an application filed with the Securities & Exchange Commission by Yankee Atomic. The 12 sponsoring companies are electric utilities in the New England area, and are the sole stockholders. Proceeds of the stock issue will be used in part to retire $1 million in short-term notes held by these companies, with the balance to go into construction. Yankee Atomic notes in its SEC application that its 134,000 KW nuclear power plant at Rowe, Mass., is now expected to cost $60 million. When project had been initiated in 1955, original estimate was $35 million.

URANIUM STOCKS SHARE GENERAL MARKET DECLINE:- The violent share unloading of traders in the U. S. and Canadian markets in the last fortnight saw uranium shares in New York and Toronto registering substantial losses. On the Toronto exchange, where uranium shares for months had shown weakness, the last fortnight's strong selling wave brought down share prices of such strong issues as Gunnar, Consolidated Denison, and Can-Met. This was to be expected, however, since such blue chips as DuPont, Telephone, and others showed losses of many points on the New York exchanges. Easson's uranium index reached the year's low of 181.5 for the week ending Oct. 22nd, (Monday, Oct. 21 being a day of particularly violent selling on the New York exchanges), and compares with 243.1 for the week previous. Some losses were erased at the mid-week rally (last week), but all had far to go to regain lost ground.

A CORRECTION: This LETTER stated Oct. 15, 1957, Vol. 18, No. 5, that Nuclear Science & Engineering Corp., Pittsburgh, intended to use part of proceeds of its new public stock offering to purchase $8,000 worth of additional equipment. Actually the company plans to buy $80,000 in new apparatus.

PEOPLE...in nuclear work...

Professor Niels Bohr was awarded the first Atoms for Peace Award of $75,000 in ceremonies last fortnight in Washington. The awards were established by Ford Motor Co., and provide $1 million fund to be used for a 10 year period for annual awards to the person making the greatest contribution to peaceful uses of nuclear energy.

Peter Fortescue has joined General Atomic Division of General Dynamics Corp. as chief research and development engineer. Dr. Fortescue made important contributions to the development and construction of Britain's Calder Hall power reactors.

Bernard I. Spinrad has been appointed director of the reactor engineering division of Argonne National Laboratory, Lemont, Ill. Dr. Spinrad succeeds the late Arthur H. Barnes.

Sincerely,

The Staff,
ATOMIC ENERGY NEWSLETTER

October 29th, 1957.